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February 20, 1862.

Major-General SABINE, President, in the Chair.

The following communication was read:—

“On the Dicynodont Reptilia, with a Description of some Fossil Remains brought by H.R.H. Prince Alfred from South Africa in November 1860.” By Professor R. OWEN, F.R.S. &c. Received January 23, 1862.

(Abstract.)

In this paper the author describes some fossil remains obtained, at the suggestion of H.R.H. the late Prince Consort, by H.R.H. Prince Alfred, during his journey in South Africa. They are referable to two genera of Dicynodont Reptilia. The first specimen is an unusually perfect specimen of the skull, retaining the lower jaw in connexion with the tympanic pedicles, of a species of *Ptychognathus*, showing distinctive characters from previously described species, and which the author dedicates to its discoverer under the name of *Ptychognathus Alfredi*. The anatomical characters of this fossil were described in detail. It was obtained from a greenish sandstone, probably Triassic, of the Rhenosterberg, South Africa.

The second specimen is the skull, with the lower jaw, also *in situ*, of a true *Dicynodon*, referable by its size to the largest known species (*Dicynodon tigriceps*, Ow.). The right maxillary and zygomatic arch having been partially removed in quarrying the rock containing the fossil, a further detachment of the matrix brought into view the descending cranial plate of the frontal, the interorbital septum, the upper surface of part of the bony palate with the pterygoid, and the rhinencephalic continuation of the cranial cavity. The presphenoid projects forward as a compressed plate, exceeding in relative length and extent of ossification that in Chelonia, and more resembling that in Crocodilia. Anterior to the presphenoid is the vomer, which expands laterally to join the palatines and pterygoids. Other cranial characters deducible from the present and not shown in previous specimens are noticed. As a whole, the skull exemplifies the near equality in size of this extinct two-tusked reptile of South Africa with the existing Walrus; and it

shows that in the structure of the bony palate, as in some other parts of the skull, the *Dicynodon* combines Crocodilian with Chelonian and Lacertian characters.

The specimen above described was obtained by H.R.H. Prince Alfred, from the Karoo beds, in the district of Graaf Reinet, South Africa.

The author next proceeds to describe the pelvis of a *Dicynodon* equalling in bulk the *D. tigriceps*, and most probably belonging to that species. It includes, with five sacral vertebrae, the last of those of the trunk which supported free ribs, showing that there are no vertebrae having the character of lumbar ones in *Dicynodon*. The length of the six successive centra was 1 foot 2 inches. The ribs of the first sacral vertebra resemble in size and shape the human scapula, but are much thicker; their expanded terminations, 6 inches in breadth, underlap or pass anterior to the iliac bones, to which this rib has been attached by syndesmosis. The ribs of the succeeding sacral vertebrae are shorter and thicker, and abut against the ossa innominata, as far back as the ischial tuberosities. The ilium, ischium, and pubis have coalesced to form one bone, as in some lizards and in mammalia; and, as in the latter class, the symphysis at which the ischio-pubic portion of each os innominatum joins its fellow is continuous; the pubic symphysis is not separated from the ischial symphysis. But ossification has advanced further than in any mammal, to the complete obliteration of the obturator foramina, which in most reptiles are represented by very wide vacuities. The pubic bones show an oblique perforation near the acetabulum, homologous with that which co-exists with large obturator openings in most lizards. The brim of this singularly massive pelvis measures 10 inches in antero-posterior, and 11 inches in transverse diameter: the outlet measures 4 inches in antero-posterior, and 9 inches in transverse diameter.

In the comparison of this, at present, unique type of pelvic structure, it is interesting to observe, in connexion with the mammalian tusks in the skull, a mammalian condition of the symphysis pubis, and also a mammalian expansion of the iliac bone. In the number of sacral vertebrae *Dicynodon* resembles the Dinosaurian reptiles, as well as some mammalia; and hence it may be inferred that, like the *Megalosaurus* and *Iguanodon*, a heavy trunk was in part supported

on a pair of large hind limbs, the weight thereupon being transferred by a larger proportion of the vertebral column than in the prone crawling crocodiles and lizards of the present day.

The author, from certain associated fossils, deduces a probability of the triassic age of the sandstones including the above-described South African Reptilia, and remarks that it is in a sandstone of triassic age in Shropshire where fossil remains occur of a reptile which, in biting with trenchant edentulous jaws, also pierced its prey by a pair of produced weapons analogous to the tusks of *Dicynodon*. Of this reptile, the *Rhynchosaurus articeps*, Ow., the author describes the skull, vertebrae, and some other bones, which have been lately discovered in the New Red Sandstone of Grinsill, Shrewsbury. The remains of the limb-bones in this specimen bespeak a reptile capable of progression on dry land, as well as of swimming in the sea—of one that might leave impressions of its foot-prints on a tidal shore.

This paper is illustrated by numerous drawings.

February 27, 1862.

Major-General SABINE, President, in the Chair.

The following communications were read:—

I. "Notices of some Conclusions derived from the Photographic Records of the Kew Declinometer, in the years 1858, 1859, 1860, and 1861." By Major-General EDWARD SABINE, P.R.S. Received February 6, 1862.

The discussion of the magnetic observations which have been made in different parts of the globe may now be considered to have established the three following important conclusions in regard to the magnetic disturbances: viz., 1. That these phenomena, whether of the declination, inclination, or total force, are subject in their mean effects to periodical laws, which determine their relative frequency and amount at different hours of the day and night. 2. That the disturbances which occasion westerly and those which occasion easterly deflections of the compass-needle, those which increase and those which decrease the inclination, and those which increase and those which decrease the magnetic force have all distinct and generally different periodical laws. 3. That there exists a periodical